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ABSTRACT

Drawing from an analysis of more than 50 documents related to the need for technical education and training in Texas, and from interviews with 29 individuals knowledgeable about the state's technical education and training, this report assesses the current statewide capacity to to adequately train the workforce that is the expected requirement for Texas by the year 2000. From this analysis, several key trends and issues are identified, including an occupational shift toward a large number of low-wage, low-skill, low-knowledge requirement jobs, and a growing number of high-skilled, high-tech jobs; demographic trends indicating an "aging," and increasingly ethnically diverse workforce; differing population trends for urban and rural areas, complicating regional planning considerations; the importance of funding and resource allocation with respect to quality work force planning efforts and tech-prep programs; and the leadership role and responsibilities of the Texas Higher Education Coordinating Board (THECB) in meeting educational needs. Based on these trends, the following recommendations are presented: (1) the public community and technical colleges must constitute the primary delivery system for technical and adult training and retraining; (2) statutory changes, interagency agreements, and rule changes should be made to enable the THECB and the community colleges to assume this responsibility; (3) state leadership should facilitate the annexation of counties into community college service areas; (4) the THECB should work to develop an automated student follow-up system that links high schools and post-secondary institutions; and (5) the THECB should provide funding incentives to the Texas State Technical College System to carry out its mission of providing programs in advanced and emerging high-skill occupations. Includes references and population and enrollment data. (PAA)

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TECHNICAL EDUCATION AND TRAINING IN TEXAS

A report prepared for the
Texas Higher Education Coordinating Board

April 1992

by

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TABLE OF CONTENTS

I. Executive Summary

A. Recommendations

II. Report

A. Introduction
B. Background Studies
C. Summary and Conclusions
D. Some Questions That Need Answers
E. Recommendations

Appendices

A. References
B. Interviews
C. Texas Population by Higher Education Region 1980 - 1990
D. 1986 - 1991 Enrollment/TSTC & Community Colleges
E. TIINS: Technology and Emerging Occupations
F. Texas Department of Commerce - Target Industries

EXECUTIVE SUMMARY

This report is focused on the needs in Texas for technical education. When one examines the statewide needs for technical education and training in 1992 and projects those needs into the 21st century, several key issues appear. This report discusses these issues, raises questions related to the Texas situation, and suggests actions that the state leadership may take in the immediate future. Texas has available a system of institutions that can take care of the needs; Texas has commissioned a number of studies that explore these needs in great detail; and Texas is able, with very few changes, to implement a sound program in the technical education and training area that will provide for the needs as defined at this time. There are, however, several key issues that must be considered:

1. The Texas political and educational leadership must clarify the goals of technical education and training for the state, making certain that all who are involved understand them. Various agencies, commissions, committees, task forces, as well as individuals have suggested these goals and their conclusions may be summarized by stating clearly that the major priority is (a) to provide Texas employers with a work force that is skilled and educated to a level that will support productivity in an internationally competitive economy and (b) to provide the citizens of Texas with educational opportunities that will equip each person with occupational skills that will allow him/her to become productive citizens in a shifting labor market that must compete in a global economy.

A number of reports have emphasized these goals:
The Master Plan for Vocational and Technical Education, the Sharp Report, the Master Plan for Texas Higher Education, the Governor's Task Force on Vocational Education, and the TIINS reports, to name only a few.

2. Current trends in Texas indicate an occupational shift toward a large number of low-wage, low-skill, low-knowledge-requirement jobs, as well as a growing percentage in high-skilled, high-tech jobs. It is essential that Texas higher education provide the requisite educational opportunities that will provide each individual in the state the knowledge and skills that will enable him/her to become a competent, productive citizen at the highest possible level for that individual. It is also essential that Texas provide encouragement to individuals to gain the competence that will enable them to provide for the business and industry work force needs in those industries targeted by the Texas Department of Commerce as high-skill/high-wage occupations that are necessary for Texas to become a world leader in the emerging global economy.
Examples are the research reports of the Texas Employment Commission that project a high need for janitors, cleaners, and cashiers, and the Texas Innovation Information Network System that projects needs in technology and emerging occupations.

3. The current trends in Texas demography indicate major shifts in the characteristics of the population: race/ethnicity, sex, age, economic level, educational attainment, and population increases.

Furthermore, these shifts are different in the various regions of the state; they are also different in the various ethnic groups that make up the state's total population.

The Texas State Occupational Information Coordinating Committee reports emphasize these changes, as well as a special report by Murdock and Ellis. Similar emphasis upon the increasing diversity of the potential work force is summarized by the Strategic Economic Policy Commission.

4. The existing system of higher education in Texas has the potential to provide the requisite educational opportunities for technical education and training in the community and technical colleges as the needs have been defined by the studies of a number of agencies. The system needs only fine tuning, however, in order to provide the opportunities where they may be needed, when they may be needed, and at the level at which they may be needed. This means minor changes in the system and structure and major changes in the processes for developing new curriculum and allocating resources. Major leadership decisions will be required to provide the necessary allocation of resources that will enable each institution to provide the educational opportunity in an efficient and effective manner at the highest possible quality. This leadership role is assigned to the legislative branch of Texas state government, the executive branch of state government, and the Texas Higher Education Coordinating Board with its constituent institutions.

Over a number of years Texas has evolved an established system of higher education providing for the needs of citizens living in this state. In an attempt to make this system serve the needs of the state in an efficient and effective manner, the Legislature has designated the Texas Higher Education Coordinating Board as the state's agency to implement the educational needs. A number of reports describe the planning of the Coordinating Board and its policies, including the Master Plan for Texas Higher Education, Technical and Vocational Program Guidelines, and other policy and operational statements.

5. The roles of the Coordinating Board in meeting the educational needs noted above include the provision of leadership in the implementation of the Master Plan for Vocational and Technical Education, assistance in the development and implementation of the planning for the regional service areas as originated by the 24 Quality Work Force Committees, and the development and enforcement of the criteria and standards for program approval. The constituent institutions, the Texas State Technical College System, the community colleges, and the universities, have specific roles to play as defined by the statutes in providing the educational opportunities to the citizens of Texas. It is the responsibility of the Coordinating Board and the colleges to create together the most effective and the most efficient methods for providing those opportunities.

The Texas Legislature has established the roles and the scope of those roles by statute. These are specific in their intent and can be enforced by the Coordinating Board. If questions arise concerning

roles, reference to the statute is the appropriate action.

6. The development of requisite standards that assure proper accountability for these responsibilities is also a part of the role of the Coordinating Board and will require that the Board clarify the goals for developing technical education and training and the ways that will indicate that they have been achieved. Wide participation on the part of the constituent institutions in this activity will assure a high quality result. It is incumbent upon the Coordinating Board that unwarranted competition among institutions be eliminated as completely as is possible and that the citizens of the state be provided technical education and training in the most efficient manner possible in keeping with the allocation of available resources. The statutes define the duties and responsibilities of the Coordinating Board, provide it with authority to act, and the resources to carry out its responsibilities. The Coordinating Board has published a number of statements of standards and policies and has established a rational process to carry out its assignments. There is ample opportunity for participation in the decision making for those who may be directly involved.

7. The Legislature is to be congratulated for having established a rational process for making decisions regarding allocation of resources and the control of duplication and competition among the institutions. It is incumbent, however, to make certain that any proposed legislative actions that may appear to be based solely upon local interests, but which in reality have unintended effects upon

statewide policy, do not negate the process which the Legislature has set up. Legislative interventions, whether they be intentional or unintentional, are costly in terms of time and resources, particularly when legislative countermands cause duplication of programs and expenditures that could have been avoided.

Specific examples of legislative interventions may be documented within the past few years. These will be expensive to the state in both short runs and the long run. Sometimes these interventions create new policy that will increase the costs considerably over the long run.

8. The fact that all areas of the state are not currently incorporated into community college service areas is a peculiar inequity in Texas higher education. Some citizens of the state participate in supporting a community college and receive the educational services needed for the development of educational skills, basic, technical and academic. Other citizens, particularly those living in rural areas, do not provide support for the community colleges nor do they always receive adequate educational opportunities. Plans have been in existence for some time that would correct this inequity, however, these have not as yet been fully implemented.

The need to serve all Texans is an obvious need. However, attempts to correct this situation have not been completely successful up to this time. The Coordinating Board has attempted to provide rational and progressive solutions to this problem since before 1969. These

studies and reports should be reexamined in terms of current statistics and the community college service areas enlarged through the annexation process.

RECOMMENDATIONS

The goal of providing Texas employers with a skilled and educated work force and of providing individual Texans with opportunities to become skilled employees must be a top state priority. After due consideration of the various reports and state agency recommendations, one must come to the conclusion that Texas has developed an excellent and workable process for accomplishing this goal and has established a way that will accomplish the purposes of this analysis if the following actions are taken in a firm and consistent manner:

1. The public community and technical colleges must constitute the primary delivery system for technical and adult training and retraining, and the Texas Higher Education Coordinating Board should make the proper referrals for training to the community and technical colleges as is consistent with their role and mission as defined in the statutes;

2. Statutory changes, interagency agreements and rule changes should be made as needed to enable the Coordinating Board and the public community colleges to assume this responsibility as the primary delivery system for adult training and retraining opportunities, including literacy and workplace basic skills education; and

3. The support of the state leadership for the meaningful and coherent system of higher education that has been established in Texas needs to be affirmed clearly by assisting the Coordinating Board in its assigned role whenever possible and by facilitating the annexation of counties into community college service areas as may be recommended

by the colleges and the Coordinating Board.

4. There are, therefore, some specific actions that involve the Texas Higher Education Coordinating Board in accomplishing these recommendations. The Texas Higher Education Coordinating Board should:

a. Provide continued support to the tri-agency partnership of the Texas Education Agency, the Texas Department of Commerce, and the Coordinating Board for the development and improvement of an integrated vocational/technical education delivery system, using the responsibilities of this partnership as a vehicle for carrying out the legislative mandate for vocational/technical education.

b. Work with the tri-agency partnership to move even more rapidly to implement an automated student follow-up system that links high schools and institutions of higher education.

c. Provide continued support to the activities of the Quality Work Force Planning Committees to incorporate their planning recommendations using the incentives of reallocation of resources where needed.

d. Reexamine and clarify where necessary the rules and procedures for developing and approving requests for programs and courses consistent with institutional role and mission.

e. Redefine out-of-district boundaries to ensure that every county in the state is included within the service delivery area of a single community college. In order to accomplish this, work with the Texas Public Community/Junior College Association, the local counties,

and the Texas Legislature to develop mechanisms and procedures that will facilitate the annexation process, with a goal of completing the entire state (every county included in a community college district) before 2000.

f. Re-assess the existing rules on provision of instruction and contracted services in out-of-district locations to ensure appropriate prior consultation with community colleges regarding instructional offerings in a community college's district by another institution of higher education.

g. Provide leadership and encouragement for Texas State Technical College System (TSTC) to carry out the mission assigned to the college by the legislature by providing funding incentives that will encourage changes in the institutional program mix, so that by 1996, TSTC will provide a majority of its programs in those areas that address advanced technology and the resultant emerging, high-skill occupations in those technological fields.

h. Provide support for start-up funds for the development of prototype programs in advanced and emerging technologies, including capital improvements at the campuses of TSTC, limiting the college to campuses that serve the programs needs in advanced technical education for the entire state, not for a local need. TSTC offerings should be limited solely to programs instead of single courses. When the demand for a specific course that may be appropriately provided by TSTC is identified, the Coordinating Board should authorize TSTC to offer the course through a local community college which would act as a broker

for that particular course.

i. Design and/or contract for services that will undertake a cost benefit analysis of the economic impact of the educational and training services provided by the public community colleges in the state.

TECHNICAL EDUCATION AND TRAINING IN TEXAS

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James L. Wattenbarger

INTRODUCTION

The preparation of this report involved the examination of more than 50 documents, including more than 2500 pages of reports, policy recommendations, and other statements related to the statewide needs for technical education and training in Texas. These have been prepared during the past few years by a number of committees, commissions, councils, agencies, and other governmental and private groups. They are listed at the end of this discussion. Since 1980, Texas has prepared many similar reports, and these provide an excellent background, adequate and sufficient to make the critical decisions that are currently needed.

The attention of this report is focused upon an assessment of statewide needs for technical education and training in 1992 and the current capacity to deliver the training that will develop the skilled work force that is projected as the expected requirement for Texas by the year 2000. The recommendations made herein are designed to assist the Texas Higher Education Coordinating Board in making this happen. The methodology did not create new data (there is obviously no need for that), but rather was a limited review of selected documents and was, therefore, focused upon the existing reports that have been prepared by a number of agencies in Texas during recent years (See Appendix A). It was also focused, however, upon a series of conferences and interviews with individuals who have knowledge of technical education and training in Texas (See Appendix B). Finally, the report includes, where appropriate, reference to experience in other states as well as past performance in Texas.

BACKGROUND STUDIES

Since the early 1980s, a number of agencies in Texas have given a great deal of attention to the need for education and training in the area of the technical work force as projected in Texas. Of particular note are reports from the Texas Employment Commission, the Texas Department of Commerce, the Strategic Economic Policy Commission, the Texas State Occupational Information Coordinating Committee, and the Texas Innovation Information Network System (TIINS), as well as the State Board of Education, the Texas Higher Education Coordinating Board and the Texas State Technical College. These reports emphasize that the Texas labor market ranks third in the nation and is very much affected by the national, as well as the regional and the state, labor force needs. Even though the labor force has grown during the past decade, there is currently unemployment that reflects problems in the profile of the American labor force, problems that are reflective of slower growth, structural change, competition, and an economy that has a global emphasis.

Jobs in Texas. The Texas Employment Commission in their report of October 1991 (Volume 1,Issue 1), points out that during the eighties, there were a number of industries that added the most new jobs in the state. Almost all of these were jobs in the service occupations, e.g., health services, governmental services, repair services, food/drink services, sales services, amusement services, educational services, hotel services, and similar jobs that reflect higher amounts in the current wages but lower real wages for the employed. The goods-producing industries, while decreasing as a percentage of the total, maintained a higher wage level than the more rapidly growing service industries.

A conclusion of these analyses of statistics and other trend indicators is, that while the greatest increase in employment was in those occupations within the higher education knowledge-base requirements, almost 40% of employment growth was concentrated among occupations within the lower knowledge-base requirements. Occupations that have added the most jobs during the past decade included such occupations as janitors and cleaners, cashiers, and secretaries, occupations that will require some preparation but not a great deal of technical training or other types of higher education programs. On the other hand, health services, such as nursing, as well as computer services, require at least an associate degree, and public school teachers at least a bachelor's degree. These are occupations that will be in short supply in the rather immediate future. One must note, however, that all employed persons benefit from competence in the basic skills and that need will continue as it has in the past.

Emerging Occupations. The Texas Department of Commerce, working with the Texas Innovation Information Network System (TIINS), issued a report in April 1990 that looked toward the 1990s to describe emerging occupations. TIINS identified six technology groups that are expected to affect industrial employment at the national level. These are: information; energy and environment; medical and health care; laser/electro-optics; manufacturing, design, and engineering; and biotechnology. TIINS translated these technologies into the Texas labor market needs, and the State Board of Education placed three occupations on the state list of priority occupations: Network Systems Technician/Administrator, Telecommunications Specialist, and Information Technology Support Specialist. These are classified as emerging occupations and are expected to grow within the 90s. All of

these require at least two months of specific technical education or training.

Using a focus group analytical methodology, TIINS was able to identify 40 changing and emerging occupations, several in each one of the six groups listed above. All of these require the attention of the higher educational institutions in Texas and will have relatively different impact upon the various regions in the Texas systems. Some occupations have statewide employment potential, while others will be limited to specific areas of the state.

Demographic Changes. However, the Texas State Occupational Information Coordinating Committee (SOICC) report entitled TARGETING YOUR LABOR MARKET provides assistance for such regional planning. In this report, of particular value are several observations listed by the authors. Noteworthy, as a part of this discussion, is the fact that "aging" as a demographic influence will become increasingly important in the work force and that minority groups (Blacks, Hispanics, and women) will all become a larger part of the labor force. The report also notes that part-time work will become a larger segment of the total (See Appendix C for 1980 - 1990 Census data in Texas High Education Regions).

Patterns of ethnic change that have already occurred during the 80s in Texas have been described by Steve Murdock and David Ellis, Department of Rural Sociology, The Texas Agricultural Experiment Station, The Texas A&M University System, in a February 1991 report. Using data from the 1990 Census and correcting it in order to obtain mutually exclusive categories, the authors point out that the growth in minority populations in Texas has been "dramatic". Although minority populations constituted only 34% of the total Texas

population in 1980, these groups accounted for 66% of the population increase between 1980 and 1990. Hispanics alone accounted for almost half of the net increase.

Of special importance in their report is the fact that the growth patterns were very different among the counties and, therefore, the regions of the state. The metropolitan areas of Texas predominate, and almost 93% of the population growth occurred in the SMSAs between 1980 and 1990. The slower growth of the Anglo population in these areas was largely compensated for by a more rapid growth of the Hispanic population. The Black population, on the other hand, experienced growth mainly in two areas of the state, Dallas and Houston, where almost two-thirds of the increase occurred. Other (Pacific Rim ethnic population) growth was also concentrated in metropolitan areas, specifically Houston, Dallas, Fort Worth-Arlington, Austin, and San Antonio. These changes have very special implications for the development of statistical analysis and occupational potentials of the regions of the state.

Regional Differences. These trends have been reemphasized in another report, this one submitted by the Strategic Economic Policy Commission to the 71st session of the Texas Legislature in January 1989, entitled A STRATEGIC ECONOMIC PLAN FOR TEXAS. This report notes that Texas minorities have yet to realize the same education and income levels as the Anglo population. Almost half of the fastest growing portion of the population does not complete high school, the Hispanic group has a 45% dropout rate, as compared with 27% for the Anglo group. Texas ranks 47th among the 50 states in literacy, complicating the problems of education and training even further. The increasing number of single parent families, as well as the dual roles

of wage earners, have changed "family" life and reflect national trends as well. Finally, the aging of the population will result in a much larger portion that are past age 65 and may contribute to a labor shortage in Texas within the foreseeable future.

To this summary of the demographic trends, the Commission adds its concern for the loss in Texas of a leadership role in the global marketplace and in technological innovation. The Commission suggests that public policy can have a direct effect upon the future of the state through controlling the costs of doing business, through encouraging business development, through impacting the quality of life, through improvement of the infrastructure, and through providing for a critical service such as education. They list "a highly skilled workforce" as a primary factor in the development of a diversified and expanding economy and point out that a "solid base in higher education" is one of Texas' strengths.

Their Strategic Objective Two: Provide a well skilled, flexible, internationally competitive work force offers the base that is needed for Texas to use its higher education system to the advantage of the people of the state. The plan for immediate action that is outlined envisions a very active role for the higher education system involving the necessity for planning by region.

In another recent (August 1991) study/report authorized by the Department of Commerce, PROMARK examined business relocation and expansion in Texas as compared with a number of other states. By collecting opinions from a sample of key industries drawn through Dun & Bradstreet, from companies that have recently relocated in Texas, and from a list of relocation consulting firms, PROMARK emphasized three points that are specifically pertinent to this discussion.

Texas is viewed as meeting expectations (a strength) in reference to the available technical and higher education training. Texas is perceived as not meeting expectations (a weakness) in the availability of a labor force with the required skills, and target industries express preferences for selected areas of the state. These conclusions are in keeping with the other reports. While availability of technical education and training is not so much a question or concern, there has not been enough use of this availability to prepare the population for the specific unfilled jobs, and, furthermore, these problems will be different in the various regions of the state.

PROMARK also listed several industries that expressed difficulty with finding available labor force with requisite skills: plastics, electronic components, biotech (drugs), and communications equipment. In contacting those industries that relocated to California and/or North Carolina instead of Texas, PROMARK reported that "the available labor force" was at the top of the list of items that influenced their decision, both as an item of importance and as an item wherein Texas did not meet their expectations.

Another document that provides additional information relating to the need for technical education and training is a review of the provisions of the North American Free Trade Agreement (NAFTA). Certain industries such as horticulture, textiles and apparel, and inexpensive glassware will be produced at less expense in Mexico, for example, and will, therefore, provide less opportunity for employment in the United States. On the other hand, industries requiring technical skills will need more employees. The report emphasizes that these changes will be gradual, but that state concern and cooperation in providing for dislocated workers is very much needed at this time

to supplement the federal funds that may be available.

Quality Work Force Planning. The Quality Work Force Planning Unit representing a tri-agency initiative by the Texas Education Agency, the Texas Higher Education Coordinating Board, and the Texas Department of Commerce in September 1990 issued a report, TEXAS QUALITY WORK FORCE PLANNING: PREPARING TEXAS FOR THE 21ST CENTURY THROUGH A SKILLED AND EDUCATED WORK FORCE, that developed a proposed link between "identifying employer needs and ensuring that students who complete vocational-technical education and training programs are prepared for employment in the year 2000 and beyond". This report emphasized the potential for planning through nine pilot projects drawn from the 24 planning regions in Texas. These pilot projects demonstrated the procedures that may be used in planning at the regional level and developed a regional service plan based upon targeted occupations and related programs, services, and activities. The step by step model that was evolved from these pilot projects will serve as a basis for the other 15 regions as may be determined. This report provides the blueprint for a solution; personnel must be the ones to implement the model.

Since more than 184,000 Texas students enrolled in technical programs as their major field of study in 1990-91 (See Appendix D), it is crucial to have outstanding programs. A major problem, however, in implementing any of these recommendations for new programs will be the identification of "start-up" funds since no source is currently identified for the community colleges or for TSTC, and it would be difficult to take such costs from existing operating funds.

The Texas State Technical College System in an analysis of the need for expanded access reports on nine regions in the state. These

are not identical with QWFP regional designations and, therefore, may cause some confusion with the planning referred to above. The report, however, details the data for each of the designated regions and makes specific recommendations for each situation. The report concludes with recommendations for the East Texas Region (3) to be located at Marshall. An interesting and unusual feature of this proposal is the inclusion of a proposed interstate service area emphasized by including Shreveport and Bossier City in the statistics and the planning; the responsibility of the State of Texas for educating persons in Louisiana is a new concept.

TIINS Planning. In 1990, TIINS formed six Technology Skills Advisory Panels (TSAP) which through a structured discussion of emerging technologies and prototype job descriptions developed earlier by TIINS would provide additional information to help educational institutions in curriculum development through the DACUM process. Seven specific tasks were assigned to these TSAPs. These panels met and made recommendations that deleted nine occupations and added two new occupations; Office Automation Specialist and Hazardous Materials Technical Coordinator. In two other cases occupations were combined to create more general, and stronger, job descriptions: the Laser/Electro-Optics technician occupations were combined into a single core training specialty and the manufacturing TSAP panel created out of two existing occupations a new occupation: a Manufacturing/Automated Systems Technician. Other changes included revisions and other modifications of occupations needed in Texas. (See Appendix E for a list of the 1991 occupations).

A 1991 report of the State Board of Education presents a current priority occupations list that adds information to the lists developed

by TIINS and other agencies. This list adds four new occupations to the TIINS' summary. In addition, the Governor's Office and the Department of Commerce are challenging educators to train Texans for high-skill/high-wage or "Smart Jobs" (See Appendix F).

Other Planning. The Texas Employment Commission's report on TEXAS WORK FORCE 2000 provides demographic data and analysis that will also be useful to the planning activity. The continued population increases in Texas that may be expected between now and the end of this century provide a potential student body need that existing institutions cannot meet unless there is adequate expansion of program availability. This report reiterates the conclusions reached by other agencies: the shift away from the goods-producing occupations into service-producing jobs, with a special increase in the eating and drinking places; and an increase in those occupations that require more education and also better basic skills: language, math, and reasoning.

It may be interesting to note that the October 7, 1991 "Perryman Texas Letter" reiterates the potential employment growth in various locations in Texas but makes no mention of the education that will be needed. Hopefully, this does not represent the attitude of business and industry. On the other hand, an analysis of the economic impact of TSTI (TSTC) conducted by Perryman Consultants recognizes the contributions of TSTC to business in the state. This report concludes that the TSTC system provides an economic impact of $25.18 for each dollar of state funds appropriated; that more than 12,400 jobs are created; that each employed graduate accounts for an average annual expenditure of $287,582; and that the average cost to the state per technician is $17,930. Similar impact information on the community

colleges is not available at this time.

A number of studies have been completed by several agencies in Texas. There apparently is no need to repeat these studies. The major responsibility at this juncture is to provide for the implementation of the technical training and educational needs in the state that have already been identified by competent studies. A large portion of this responsibility falls upon the actions of the Texas Higher Education Coordinating Board.

Tech-Prep Programs. Tech Prep programs, sometimes called "2 + 2" programs, are developing rapidly throughout the nation, although there is a great deal of variation in the definition and approach used in these programs. These programs involve planning in consortia involving community colleges and high schools in the same geographical areas that will encourage youth to begin programs while in high school that lead to technical occupations. In Texas, the tri-agency partnership of the Texas Higher Education Coordinating Board, the Texas Education Agency, and the Texas Department of Commerce provides technical assistance to local planning consortia. Grants to assist in this planning are available from the Carl Perkins funds. Tech-Prep Associate Degree Program Guidelines will be available from the Coordinating Board later this year.

STARLINK. STARLINK was established in 1989 by the Coordinating Board to address technical faculty professional development needs in Texas' two-year higher education institutions. The major purpose is to allow faculty in all parts of the state to participate in faculty development activities in live video teleconferences that are focused upon the improvement of these technical programs. The network is managed by Austin Community College and the Dallas County Community

College District. Each Texas two-year institution of higher education has a STARLINK liaison representative who serves on one of eight regional committees with the chair of each regional committee serving on a statewide advisory committee that also includes members from business and government. This committee makes final decisions on the teleconference programs which are then implemented by the two STARLINK directors, one in Dallas and one in Austin.

Start-up funding was provided by a Perkins grant and the network fulfills the mandate specified in the Texas' Master Plan for Vocational and Technical Education. Other state agencies are also interested in the potential that this network has for the personnel within their responsibilities.

Restructuring Responsibility. In order to provide the programs that are identified above, there must be careful study on the part of the Coordinating Board of ways to accomplish the goals in the most effective and most efficient manner. Texas laws provide definitions of the assigned mission of the institutions, and Texas laws also assign the responsibility for decision making in allocating program responsibility to the Coordinating Board. There have been several studies that have made recommendations related to these responsibilities. For example, the Sharp Report issued in 1991 recommends that all public higher education institutions review their operations with a focus upon their primary mission. A report is due in the Fall 1992. The Report also urges the Coordinating Board to implement its charter with respect to the development of a statewide data base in order to assess the higher education system. The performance review portion of the report recommends that fiscal and program authority for "vocational and adult education" be consolidated

under one agency to achieve maximum funding and program effectiveness. The Coordinating Board is one of the suggested authorities for this responsibility. The Coordinating Board has similar authority at the present time for technical education and training.

Annexation. Less than 40% of the geographic area of the state is included in a community college support district. A major difficulty in implementing the statewide needs is found in the attempts to provide educational opportunities to those areas that are not within a district. If one looks at a map where the community college areas are specially colored, one sees a very spotty map of Texas. This need for a complete plan that would include all of the state within community college districts is not a new problem, but it becomes a more intense problem when the state tries to provide educational opportunities for all citizens. The recommendations of the Quality Work Force Planning Committees are affected, the implementation of the TIINS recommendations are hampered, and the Sharp Report recommendations become particularly pertinent.

An advisory committee, chaired by Dan Angel in 1988, conducted a review of the history of the annexation problem in Texas and recommended a procedure for annexing areas of the state that are in community college unofficial service areas. This report follows a concern of the Coordinating Board that has been expressed repeatedly in the past. In 1969, a Coordinating Board report entitled "The Development of Community Colleges in Texas" describes roles, financial procedures for support, and projections for growth with the objective of dividing the state into 53 geographic regions for community college purposes. These recommendations were based upon the work of Dr. C. C. Colvert of The University of Texas.

There is a pressing need at the present time to reexamine the procedures for annexation and to proceed until all of the state is included in a community college district. A time line should be established by the Coordinating Board that will enable the state to provide the education that is called for in the reports described above. A number of other states have completed this process within the past few years. A statewide master plan for community colleges is a generally accepted concept in Florida, in California, in Illinois, in Washington, in New York, and in Virginia, to name only a few.

SUMMARY AND CONCLUSIONS

1. There are a number of emerging occupations that will require a great deal of planning in order to provide the educational and training experiences that are needed. These will have limited demand, as well as different intensity of demand, in various regions of the state. There is evidence that many changes will be rapid and often in these occupational areas.

2. Since some of the highest demand for employees is found in occupations that require little technical or higher education preparation, there is a strong need to be concerned for providing workplace basic educational skills for all types of employment. Without competence in these basic skills, little progress can be expected in preparing persons for any of the technical and specialized areas. In spite of the fact that most of these skills should be gained while the individual is in high school, many workers will need additional and continuing work in these skill areas if they are to be the kind of labor force that Texas needs. While there will be a great need for skills that require more education, there will also be a continuing need for all individuals to acquire competence in the basic skills of language, math and reasoning. Attention to solving this problem will require a partnership of several agencies.

3. Forecasts of occupational needs in the state are not uniform across the state; regional differences require specific planning that is sensitive to the special needs in each region. The Quality Work Force Planning Committees provide the mechanism for these forecasts, as well as the subsequent planning. The Texas Quality Work Force Planning model provides a basis for the development of specific

education within the 24 regions that are currently designated for work force planning.

4. Demographic and ethnic changes that have occurred during the past decade have emphasized population changes that will affect the educational and training needs within the state during the short term future in particular. Problems for individuals and for groups within the state as may be related to dislocated workers must also be considered a part of the planning consideration to meet the needs.

5. Businesses and industries that have considered Texas for relocation emphasize the availability of skilled workers as a factor in their decision-making, as well as the quality and quantity of higher education and training. It, therefore, comes important that Texas higher education provide the best possible educational opportunities in order to serve the needs of the state as well as the needs of individuals.

6. Even though the Texas State Technical College serves the entire state, the college has four campuses that are located in Quality Work Force Planning Regions (1, 7, 11, and 21) providing a basis for consideration of TSTC impact in each instance. Existing programs in all of the community and technical colleges in these four regions are clustered into six categories. There are almost 2000 programs currently approved in the state. One of the Coordinating Board's responsibilities is to establish procedures for approving these programs and this task has already been completed. This action is necessary in order to prevent unwarranted duplication as well as to eliminate gaps in educational opportunity.

7. The current processes for analysis and revisions that have been created by Texas Innovation Information Network System (TIINS),

for example, provide a dynamic and continuing process for revisions, modifications, and corrections of the occupational potentials in Texas. These should be used. The State Board of Education generates a list of priority occupations from labor market analyses and expert review. The Board can add occupations that will require less educational preparation, when they consider them vital to the state's future (e.g., child care).

8. The economic impact of TSTC has been competently documented and indicates that the state receives an excellent return on each dollar appropriated. Similar information related to the other institutions under the Coordinating Board's supervision should be made available in order to assist the legislature in making resource allocation judgements.

9. The role of the Texas State Technical College (TSTC) has been described in the Texas Education Code (section 135) as placing emphasis on advanced or emerging technical programs not commonly offered by public junior colleges. The emphasis is also upon the demand within the state of Texas. There must be documented evidence that labor market demand and student interest exist before programs can be approved by the Coordinating Board.

10. The public community/junior colleges are established primarily to serve their local taxing and service districts (Section 130). Documented evidence must be provided that demonstrates that there is sufficient labor market demand and student interest for any proposed program.

11. Obviously, there is need for a policy on the part of the Coordinating Board that will prevent duplication of effort and encourage careful attention to the wise and proper use of available

public resources with a major emphasis upon meeting the labor market needs in Texas. As pointed out above, these needs will be different in the various areas of the state.

12. There is a need to begin the process of annexation of counties into the community college districts. The Coordinating Board may expect to work with the Legislature, the Texas Public Community/ Junior College Association, the local representatives and others who will be concerned with providing educational opportunities at this level.

SOME QUESTIONS THAT NEED ANSWERS

After a study of the reports and recommendations described above, one must be impressed with the amount of time and resources that have been allocated to the topic of this inquiry. Texas has an outstanding system and needs to let it operate as it has been designed. While there is always needs for fine tuning any structure, that fine tuning should be the focus rather than any attempt to restructure the systems. There are several questions, however, that require continued attention:

1. What resources and/or other encouragement will be needed in order to implement the proposed regional model for planning that has been developed?

2. What can be done to move the work of the Quality Work Force Planning Committees ahead? Resources? Attitudes? Knowledge?

3. Is the present process for approving new programs by the Coordinating Board an adequate procedure for the future?

4. Are there sufficient safeguards to prevent unnecessary duplication of needed programs?

5. Will TIINS and other such analytic and data gathering agencies continue to be productive?

6. Can the Coordinating Board combine, in a satisfactory manner, information from several agencies in order to provide assistance to the Quality Work Force Planning Regions?

7. Will the community colleges accept the responsibility to provide opportunity for <u>all</u> students to acquire the workplace basic skills?

8. Can one assume that the economic impact of the graduates of the technical programs in the community colleges is similar to that of the TSTC graduates? If not, why not?

9. Should the state provide to the Coordinating Board an appropriation as a part of the funds for the community/junior colleges that will be used as "start up" funds for new programs?

10. How well have the community colleges implemented the Tech Prep planning that has become a common procedure in many states? Are there real attempts to make secondary and higher education levels more complementary and sequential?

RECOMMENDATIONS

1. The Coordinating Board should take immediate steps to assist in implementing the annexation plans that have been developed for the community/junior colleges by its advisory committee in 1988. The necessary legislation should be prepared and passed. It would be desirable that all areas in the state be included in some community/junior college service area. While local elections should be required in order to make these service districts into supportive tax districts, every encouragement will be needed in order to develop the complete coverage in the state of local supporting tax districts for community/junior colleges. A community/junior college should be expected to provide education services to the entire service district; local tax support may be needed in order to make this possible in most instances.

2. The Quality Work Force Planning Committees should receive all possible encouragement for implementation. That planning should be used as a basis for the development of new programs no matter which institution is assigned the responsibility. The recognition that each of the regions of the state will have somewhat different work force demands is an essential part of this implementation. It will be equally important to prevent duplication and unwarranted rivalry among the various community/junior colleges as it is between the community/junior colleges and TSTC. Planning in each region must be carefully carried out and a Service Delivery Plan developed for each region. Each institution should be required to submit a letter of intent to the Board and to all colleges in the region before proceeding with plans for a new program. Negotiation should originate

and be focused in the region unless statewide demands are involved; in that case several regions or even the entire state may be involved in the discussions.

3. The processes for approving new programs need revisions that will establish clearly understood criteria for developing new programs. These should detail processes that clarify the differences between the assigned legal responsibility of TSTC and that assigned to the community/junior colleges. TSTC should be encouraged to develop limited demand programs that are "highly specialized, advanced and emerging" as prototypes that will be used by community/colleges when the demand becomes more widespread. In the second stage, TSTC can provide a particular service to the state in becoming the major progenitor of such high demand programs. When these criteria and the accompanying policies are developed, the Board should enforce the policies with strict application and narrow interpretation.

4. TSTC should be regarded as a system of colleges, each with a campus that includes dormitories and services to the state-at-large rather than to individual districts. This means that TSTC, in accord with its historic purpose, will be able to serve the state by providing programs in technical education of high quality, including the baccalaureate degree where appropriate, but will not offer single or limited courses scattered about the state in competition with other institutions. When demand is determined to be warranted solely for a specific course that TSTC should provide, the Coordinating Board should authorize TSTC to offer it through a local community/junior college that should serve as a broker for that particular course. The use of Starlink may also be appropriate with very close cooperation between the TSTC system and the local community colleges, both acting

under the approval policies of the Coordinating Board.

5. A careful analysis of the financial support programs for TSTC and the community/junior colleges should be carried out in order to make certain that the State of Texas is making a comparable effort to provide support as may be required in each institution. There should not be a financial advantage to a local area in obtaining the educational services of one or the other of the two type of institutions. A student attending one or the other of the institutions should not receive a different level of public support. This analysis should include provisions for capital outlay, as well as operating expenditures.

6. The Coordinating Board should make certain that the workplace basic skills instruction is offered in every community/junior college in the state. This should include literacy education when that need is determined. There can be no development of technical skills until the basic skills are learned. This is a primary need in order to develop the quality work force that Texas must have. A plan for an adult education program presented to the Board for each community college district may be a way to assure compliance with this requirement.

7. The Coordinating Board, with the assistance of the universities and Starlink, where appropriate, should develop a professional development program to assist in providing orientation to new faculty in both institutions, as well as to encourage the continued development and renewal of faculty in the new areas of technical education. This program will also be useful in the general improvement of faculty in general education and in teaching the workplace basic skills.

8. In order to assist the legislature in recognizing the contributions of all institutions in the state, similar data relating to the economic impact of technical and other programs should be available. A collection of common Management Information System (MIS) data with standard definitions of terms should be established for all institutions.

9. Various agencies and study groups have provided a great amount of information about the technical needs in Texas. TIINS, the Texas Employment Commission, and the Texas Education Agency, as well as other study groups, have provided detailed information concerning needs for the state. The Quality Work Force Planning Committees interpret these needs into local needs and programs. It is important that these local studies be encouraged, supported and implemented. The Coordinating Board will need to approve the proper institution of higher education (College) to provide the educational programs that meet the defined needs.

10. All community colleges should be encouraged to assist local high schools in making the transition from high school to post-secondary as smooth and well articulated as is possible. The implementation of the Tech Prep Guidelines should receive top priority encouragement.

APPENDIX A

REFERENCES

Advisory Committee on Annexation to the Texas Higher Education Coordinating Board. "ACCESS, QUALITY, EQUITY" ANNEXATION IS THE ANSWER. October 1988.

Ashworth, Kenneth H. PRESENTATION ON FORMULA RECOMMENDATIONS. Texas Higher Education Coordinating Board. January 30-31, 1992.

Austin Community College and Dallas County Community College District. DEVELOPMENT OF A STATEWIDE TELECONFERENCE TRAINING NETWORK (STARLINK). April 25, 1991.

Colvert, C.C. THE DEVELOPMENT OF COMMUNITY JUNIOR COLLEGES IN TEXAS. Coordinating Board: Texas College and University System. March 1968.

Coordinating Board: Texas College and University System. POSTSECONDARY EDUCATIONAL SUPPLY AND OCCUPATIONAL DEMAND IN TEXAS. Spring 1985.

Coordinating Board: Texas College and University System. TECHNICAL REPORT. Spring 1985.

Goodwin, Don. POSTSECONDARY VOCATIONAL EDUCATION. National Washington, D. C.: Assessment of Vocational Education. 1989.

Governor's Task Force on Vocational Education. REPORT AND RECOMMENDATIONS OF..... January 1988.

Joint Select Committee on Higher Education. FORMULA FUNDING CONSIDERATIONS AND CONCERNS FOR TEXAS STATE TECHNICAL COLLEGE. January 28, 1992.

Morrison, W.D. TECHNOLOGY & EMERGING OCCUPATIONS: Directions for Texas in the 1990s. Dallas: TIINS. April, 1990.

Murdock, Steve H. and Ellis, David R. PATTERNS OF ETHNIC CHANGE 1980 TO 1990: THE 1990 CENSUS. 1990 Census Series No. 2. Departmental Technical Report 91-2. February 1991.

Perryman Texas Letter. No. 10. October 7, 1991.

Perryman Consultants, Inc. THE ANNUAL ECONOMIC IMPACT OF TEXAS TECHNICAL INSTITUTE ON BUSINESS ACTIVITY IN THE STATE OF TEXAS. February, 1991.

Promark. SUMMARY OF RESULTS: RELOCATION AND EXPANSION STUDY. Requisition #465-1-3306 conducted for the Texas Department of Commerce. August 1991. (memeo).

Quality Work Force Planning Unit. TEXAS QUALITY WORK FORCE PLANNING: Preparing Texas for the 21st Century Through a Skilled and Educated Work Force. September 1990.

Select Committee on Higher Education. REPORT. February 1987.

Sharp, John. Executive Summary. BREAKING THE MOLD, NEW WAYS TO GOVERN TEXAS: A Report from the Texas Performance Review. Texas Comptroller of Public Accounts. July 1991.

South Plains Quality Work Force Unlimited Project Staff. .... SERVICE DELIVERY PLAN. (Project Number 11420089). June 20,1991.

State Board of Education. BIENNIAL REPORT OF PROGRESS UNDER AND COMPLIANCE WITH THE MASTER PLAN FOR VOCATIONAL AND TECHNICAL EDUCATION AND AN EVALUATION OF VOCATIONAL EDUCATION PROGRAMS. January 1991.

State Board of Education. CAREER OPPORTUNITIES IN TEXAS: A MASTER PLAN FOR VOCATIONAL EDUCATION. January 10, 1987.

State Board of Education. 1991 STATE OF TEXAS PRIORITY OCCUPATIONS. (undated).

State Board of Education, Texas Higher Education Coordinating Board. CAREER OPPORTUNITIES IN TEXAS: A MASTER PLAN FOR VOCATIONAL AND TECHNICAL EDUCATION (1989 Update). January 1990.

Strategic Economic Policy Commission. A STRATEGIC ECONOMIC PLAN FOR TEXAS. Submitted by the Commission to the 71st Session of the Texas Legislature. January 1989.

Task Force to Update the Higher Education Section of the 1989 version of the Master Plan for Vocational and Technical Education. A MASTER PLAN FOR VOCATIONAL AND TECHNICAL EDUCATION: 1991 UPDATE. September 18, 1991.

The Technical College System of Texas. A STRATEGIC PLAN FOR TEXAS STATE TECHNICAL INSTITUTE. March 1990.

Texas Education Agency, Texas Higher Education Coordinating Board with Texas Department of Commerce. TECH-PREP HIGH SCHOOL AND ASSOCIATE OF APPLIED SCIENCE DEGREE PROGRAMS: GUIDELINES FOR DEVELOPMENT AND IMPLEMENTATION. March 1, 1992.

Texas Employment Commission, Economic Research and Analysis Department. TEXAS WORK FORCE 2000. (undated).

Texas Higher Education Coordinating Board. A COMPARISON OF TECHNICAL EDUCATION PROGRAMS APPROVED BY THE TEXAS HIGHER EDUCATION COORDINATING BOARD AT PUBLIC COMMUNITY COLLEGES AND TECHNICAL INSTITUTES IN QUALITY WORK FORCE PLANNING REGIONS WITH A TSTI CAMPUS. May, 1991.

Texas Higher Education Coordinating Board. MANAGEMENT ACTION PLAN FOR THE COMMUNITY COLLEGES AND TECHNICAL INSTITUTES DIVISION. Annual Update: 12/90.

Texas Higher Education Coordinating Board. MASTER PLAN FOR TEXAS HIGHER EDUCATION 1990.

Texas Higher Education Coordinating Board. RECOMMENDED FORMULA FOR STATE-SUPPORT OF GENERAL ACADEMIC PROGRAMS. Public Junior Colleges 1992-93 Biennium.

Texas Higher Education Coordinating Board. STATE ASSESSMENT SECTION 116 OF CARL D. PERKINS VOCATIONAL AND APPLIED TECHNOLOGY EDUCATION ACT OF 1990. April 1991.

Texas Higher Education Coordinating Board. TECHNICAL AND VOCATIONAL PROGRAM GUIDELINES. January 1, 1989.

Texas Higher Education Coordinating Board. TEXAS REGIONAL HIGHER EDUCATION COUNCIL POLICY MANUAL. August 1991.

Texas Higher Education Coordinating Board, Community Colleges and Technical Institutes Division. ADULT VOCATIONAL GUIDELINES AND COMMON COURSE MANUAL. (Second Edition). June 1, 1990.

Texas Higher Education Coordinating Board Committee of Practitioners. PERFORMANCE MEASURES FOR STUDENT AND INSTITUTIONAL OUTCOMES IN POSTSECONDARY TECHNICAL EDUCATION PROGRAMS. December, 1991.

Texas Higher Education Coordinating Board, Community and Technical Colleges Division. COMMUNITY COLLEGE GENERAL ACADEMIC COURSE GUIDE MANUAL. Effective September 1992. January 1991.

Texas Labor Market PULSE. (October 1991). Volume 1, Issue 1.

Texas Literacy Council. (1991). DEVELOPING HUMAN CAPITAL: A FIVE YEAR PLAN FOR ENHANCING LITERACY IN TEXAS. Austin: Texas Department of Commerce.

Texas Innovation Information Network System & the Texas Department of Commerce. TECHNOLOGY AND EMERGING OCCUPATIONS: DIRECTIONS FOR TEXAS IN THE 1990S. William D. Morrison, Project Director. April 1990.

Texas Innovation Information Network System. TECHNOLOGY AND EMERGING OCCUPATIONS. FINAL REPORT PROJECT YEAR 1990. August 15, 1991.

Texas State Technical College System. ANALYSIS OF STATEWIDE NEED FOR EXPANDED ACCESS AND EVALUATION OF THE EAST TEXAS CENTER AT MARSHALL. August 15,1991.

Texas State Technical College System. SELECTED GRAPHS RELATED TO TEXAS STATE TECHNICAL COLLEGE GRADUATE AND ENROLLMENT CHARACTERISTICS. Waco. TX: Occupational and Institutional Research. February 10, 1992.

Texas State Technical College. A NEW WORLD OF EDUCATION: COLLEGE CATALOG 1992.

Texas State Occupational Information Coordinating Committee. TARGETING YOUR LABOR MARKET: USING LABOR MARKET INFORMATION IN REGIONAL PLANNING FOR TEXAS JOBS. by William L. McKee and Nancy L. Harrell. January 1989.

(source unknown). PREPARING FOR WORKER DISLOCATIONS UNDER THE NORTH AMERICAN FREE TRADE AGREEMENT. c. Fall, 1991. (memo).

In addition to these reports, a number of planning documents including reports and recommendations from local Quality Work Force Planning Committees were reviewed.

APPENDIX B

INTERVIEWS

I have talked (in chronological order) with the following:

Dale Campbell, Assistant Commissioner, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Sally Andrade, Director of Research and Program Planning, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Ann Lopez, Director of Institutional Programs, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Bob Day, Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Bob Lahti, Associate Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Larry Key, Director of Federal Projects, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Carrie Nelson, Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Terry Walch, Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Jon Hittman, Associate Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Ron Curry, Associate Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

T. R. Williams, Associate Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Joan Hassenflu, Assistant, Instructional Programs, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Roger Labodda, Associate Program Director, Community and Technical Colleges Division, Texas Higher Education Coordinating Board

Marvin Felder, President, Temple Junior College

Stanton Calvert, Executive Director, Texas Public Community/Junior College Association, Austin

Ronnie Glasscock, Provost, South Plains College, Lubbock

Richard Froeschle, Executive Director, State Occupational Information Coordinating Committee (SOICC), Austin

George Matott, Texas Council on Vocational Education, (TCOVE), Austin

Don Brown, Deputy Commissioner, Texas Higher Education Coordinating Board

Landrum Hickman, Director of Facilities, Texas Higher Education Coordinating Board

Roger Elliott, Assistant Commissioner, Research Planning & Finance, Texas Higher Education Coordinating Board

Randy Wallace, Director of Finance, Research Planning & Finance, Texas Higher Education Coordinating Board

Walter Guttman, Director of Finance, Research Planning & Finance, Texas Higher Education Coordinating Board

David Gardner, Deputy Assistant Commissioner, Research Planning & Finance, Texas Higher Education Coordinating Board

Georgia Hodde, Administrative Technician to Assistant Commissioner, Research Planning & Finance, Texas Higher Education Coordinating Board

Gary Hendricks, Director of Institutional Reasearch and Planning, Texas State Technical College System - Waco

Don Goodwin, President, Texas State Technical College - Waco

Will Reece, Executive Director, Texas Council on Vocational Education (TCOVE)

Cecil Groves, Chancellor, Texas State Technical College, Waco

APPENDIX C

TEXAS POPULATION BY HIGHER EDUCATION REGION*

HIGHER EDUCATION REGION	1980 Census (% of Total)	1990 Census (% of Total)	% of Change (1980 to 1990)	1990 Census (% of Regional Total)			
				Anglo	Black	Hispanic	Other
EAST TEXAS	1,233,780 (8.7%)	1,372,804 (8.1%)	+ 11.3%	1,078,143 78.5%)	229,528 (16.7%)	56,900 (4.1%)	9,825 (0.7%)
SOUTHEAST TEXAS	3,604,723 (25.3%)	4,213,592 (24.8%)	+ 16.9%	2,486,620 (59.0%)	778,518 (18.5%)	816,000 (19.4%)	149,380 (3.6%)
SOUTH TEXAS	2,623,916 (18.4%)	3,121,549 (18.4%)	+ 19.0%	1,136,754 (36.4%)	122,734 (3.9%)	1,835,039 (58.8%)	33,223 (1.0%)
CENTRAL TEXAS	1,578,171 (11.1%)	2,035,640 (12.0%)	+ 29.0%	1,454,227 (71.4%)	236,777 (11.6%)	309,932 (15.2%)	40,666 (2.0%)
PANHANDLE	377,124 (2.7%)	371,956 (2.2%)	- 1.4%	287,284 (77.2%)	13,848 (3.7%)	64,786 (17.4%)	6,400 (1.7%)
NORTH TEXAS	2,854,362 (20.1%)	3,729,150 (22.0%)	+ 30.6%	2,583,655 (69.3%)	543,425 (14.6%)	498,931 (13.4%)	113,574 (3.1%)
NORTHWEST TEXAS	565,591 (4.0%)	603,537 (3.6%)	+ 6.7%	510,017 (84.5%)	27,058 (4.5%)	59,891 (9.9%)	7,167 (1.2%)
WEST TEXAS	1,391,524 (10.0%)	1,538,282 (9.1%)	+ 10.5%	754,980 (49.1%)	69,744 (4.5%)	698,426 (45.4%)	18,330 (1.2%)
STATE TOTAL	14,229,191 (100.0%)	16,986,510 (100.0%)	+ 19.4%	10,291,680 (60.6%)	2,021,632 (11.9%)	4,339,905 (25.6%)	378,565 (2.2%)

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*Column totals may not sum to 100.0% due to rounding.
Source: Geographic Information Services, Texas Comptroller of Public Accounts (March, 1992)

APPENDIX D

Technical Program Enrollment by Declared Major* Texas Public Community and Technical Colleges Academic Years 1986-87 through 1990-91		
Academic Year (Fall, Spring, Summer I, and Summer II)	Community Colleges	Texas State Technical College System
1986-87	102,260	12,400
1987-88	118,539	12,408
1988-89	135,931	12,334
1989-90	157,860	11,558
1990-91	172,817	11,280

* Four digit HEGIS code constitutes a technical major. Undeclared majors are not included in this report. The Texas Higher Education Coordinating Board used certified student enrollment reports (CBM-001) to determine the number of technical majors enrolled in semester-length courses (or quarter-length course equivalents) for each academic year. All technical majors were grouped together, for each academic year, and then unduplicated headcounts were tabulated.

Source: Texas Higher Education Coordinating Board
June 1992

APPENDIX E

TIINS: TECHNOLOGY AND EMERGING OCCUPATIONS*

Information Technologies
- Information Technology Support Specialist
- Network Systems Technician
- Telecommunications Technician
- Computer Maintenance Technician
- Office Automation Specialist
- Database Specialist

Energy and Environment Technologies
- Laboratory Analyst/Environmental
- Instrumentation & Electrical Specialist
- Hazardous Materials Technical Coordinator
- Regulatory Compliance and Training Specialist
- Waste Recycling Specialist
- Asbestos Contractor Supervisor
- Alternate Fuel Specialist

Medical/Health Care Technologies
- Registered Nurse (AAS Degree)
- Bio-Medical Equipment Technician
- Diagnostic Imaging Specialist
- Medical Coding Specialist
- Emergency Medical Technician
- Cardiac Technician (EKG)
- EEG Technician
- Chemical Dependency Specialist
- Facilities Maintenance Technician
- Medical Laboratory Technician

Lightwave Technologies
- Laser/Electro-Optics Technician
- Precision Optics Technician (Optician)

Manufacturing, Design, and Engineering Technologies
- Manufacturing/Automated Systems Technician
- Computer Aided Manufacturing (CAM) Technician
- Computer Aided Drafting (CAD) Technician
- Computer Integrated Manufacturing (CIM) Technician

Biotechnology
- Biotechnology Research Technician
- Biotechnology Production/QC Technician

Agriculture Technologies
- Quality Control Technician - Food
- Safety/Sanitation Technician
- Food Processing Technician
- Crop Protection/Production Specialist
- Agriculture Consumer Information Specialist
- Aquaculturist
- Agriculture Technician - Textile
- Technical Sales Representative (Agriculture)
- Poultry Hatchery Supervisor

*For More Information, Contact: Texas Innovation Information Network System
Infomart
P.O. Box 5526
Dallas, TX 75207 Phone: 214-746-5140

8/15/91

APPENDIX F

DEPARTMENT OF COMMERCE

TARGET INDUSTRIES

(High wage, high skill jobs
in a high performance organization)

1. Aerospace, automotive & transportation
2. Environmental & alternative fuels
3. Life sciences
4. Electronics & computers
5. Food, fiber, & hide processing
6. Office automation & data processing
7. Plastics
8. Petrochemical, chemical, & pharmaceutical
9. Advanced technology & telecommunications
10. Tourism & entertainment

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